



Federal Democratic Republic of Ethiopia

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ET 984 (2004) (English): Cube Sugar -
Specification



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Cube sugar-Specification

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Sugar and Sugar Products (TC 22) and published by the Ethiopian Standards Agency (ESA).

The standard is a reaffirmation for reprint of the Ethiopian Standard ES 984:2004, Cube sugar-Specification, with some editorial changes without altering the technical contents in the former text.

Cube sugar - Specification

1 Scope

This Ethiopian Standard specifies the requirements and the methods of sampling and test for cube sugar manufactured from refined sugar.

2 Normative references

The following Ethiopian Standard contains provisions, which through reference to this text constitute provisions of this Ethiopian Standard. At the time of publication the editions indicated were valid. All standards are subject to revision, and possibility of applying the most recent editions of the Ethiopian Standard indicated below. Registers of currently valid standards are maintained in the Ethiopian Standards Agency.

ES 359, *General standard for the labeling of pre-packaged food.*

ES 985, *white sugar- Specification*

ES 988, *Determination of arsenic in foods.*

ES 989, *Determination of lead in foods.*

3 Definitions

For the purpose of this Ethiopian Standard the following definitions shall apply.

3.1

cube sugar

cubes or cubed blocks manufactured from refined crystalline sugar or vacuum pan sugar of fine grains.

3.2

damage

breaking of the edges resulting in disfiguring of the shape of cubes.

4 Requirements

4.1 General

4.1.1 Cube sugar shall be in the form of cubes or cuboid blocks, and shall be manufactured from refined or vacuum pan sugar. It shall be white in colour, free from dirt and other extraneous contamination.

4.1.2 Refined white sugar used in the manufacture of cube sugar shall conform to ES 985

4.1.3 The size of the sugar cubes shall be 17 x 17 x 17 mm. The tolerance in each dimension shall be ± 1 mm.

4.1.4 Hardness of blocks

The material shall satisfy the requirements of the test as prescribed in annex A. The pressure required to break each cube shall be not less than 10.5 kg/cm².

4.1.5 Damage to cubes. The damage to cubes in any single container shall not exceed 5 percent by mass of its net contents when tested by method given in annex B.

4.1.6 Disintegration test

The material shall satisfy the requirements of the test described in annex C. The average time of disintegration shall be not more than 60 seconds.

4.1.7 Cube sugar shall also comply with the requirements given in the following table.

Table 1 — Requirements for cube sugar

No.	Characteristics	Requirements	Test methods
1	Moisture, percent by mass max.	0.15	ES 985 annex A
2	Sucrose, percent by mass, min.	99.8	ES 983 annex C
3	Reducing sugars, % by mass max.	0.03	ES 985 annex C
4	Conductivity of ash, % by mass max.	0.04	ES 985 annex F

4.1.8 Cube sugar shall also comply with the requirements of heavy metals limits given in the following table.

Ser. No.	Heavy metal	Limits	Test methods
1	Arsenic, (As) mg/kg, max.	1.0	ES 988
2	Copper, (Cu) mg/kg, max.	2.0	ES 985 Annex G
3	Lead (Pb) mg/kg, max	0.50	ES 989

4.1.9 Cube sugar shall comply with microbiological requirements prescribed in ES 985 Specification for white sugar

4.2 Hygiene

4.2.1 Cube sugar shall be processed in hygienic conditions specified in ES 985 Specification for white sugar

5 Packing and labeling

5.1 Packing

5.1.1 The number of cubes corresponding to a net weight of 0.5 kg shall be wrapped together in butter paper or Kraft paper and packed in carton, unless otherwise agreed between the purchaser and the vendor.

5.2 Labeling

5.2.1 Labeling of cube sugar shall be done in accordance with ES 359 General standard for labeling prepacked products and shall include the following information.

- i) Type of the product;
- ii) Name and address of the manufacturer;
- iii) Number of cubes per pack;
- iv) Net weight of the content.

6 Sampling

6.1 General

6.1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

6.1.2 The sampling instrument shall be clean and dry when used.

6.1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contaminations.

6.1.4 The samples shall be placed in clean and dry container. The sample containers shall be of such a size that they are almost completely filled by the sample.

6.1.5 Each sample containing containers shall be sealed air -tight after filling and marked with full details of sampling date, batch number, name of the manufacturer and address and other important particulars of the consignment.

6.1.6 Samples shall be stored in such a manner that the conditions of storage do not unduly affect the quality of the material.

6.2 Scale of sampling

6.2.1 Lot-all the containers of a particular grade in single day's production shall constitute a lot.

6.2.2 Gross sample. A number of containers not less than the sample size indicated in the table below and which shall give a minimum of 1.5 kg of the material, shall be selected at random from a lot for the purpose of drawing samples for test.

This number of containers shall constitute the gross sample.

Table 3— Scale of sampling

Lot size	Sampling size
5 to 64	4
65 to 125	5
126 to 216	6
217 to 343	7
344 to 512	8
513 to 729	9
730 to 1000	10
1001 to 1331	11

6.2.3 Preparation of samples

6.2.3.1 Mix carefully, without breaking or damaging any sugar cubes, the entire quantity of the material from all the containers in the gross sample so as to form a composite sample for the lot. Divide the composite sample into three equal reduced samples. These reduced samples shall constitute the test samples, each test sample being not less than 0.5 kg.

6.2.3.2 The test samples shall be transferred immediately to thoroughly clean and dry container, which shall be sealed, air-tightened. These shall be labeled with all necessary information.

6.2.3.3 The referee sample shall be kept properly at the appropriate place for use in case of dispute

Annex A (normative)

Determination of hardness

A.1 Apparatus

A.1.1 Pressure gauge preferably with an auxiliary pointer, which will rotate but which returns to zero only through certain mechanical manipulation and not automatically.

A.1.2 Steel framework having steel ball of diameter 14mm and weight 11.9g soldered to the bottom of the metallic plate (See Fig. 1)

A.2 Procedure

A.2.1 Fix the pressure gauge on the steel frame work (see Fig. 1) and adjust the screws attached to the pressure gauge with the help of a spirit level so that the plat form of the tester is horizontal. Check up initially that the steel ball attached to the metallic frame is at the centre of the slot of the platform.

A.2.2 Place one sugar cube in the slot and work the adjusting screw (See Fig. 1) so that the sugar cube is in the middle of the slot.

A.2.3 Operate the plunger attached to the tester so that the sugar cube is pressed against the steel ball.

A.2.4 Increase the pressure till the cube breaks; note the maximum pressure recorded on the gauge. Determine the pressure similarly for 20 sugar cubes.

A.2.5 the pressure required to break each cube shall be not less than 10.5 kg/cm²

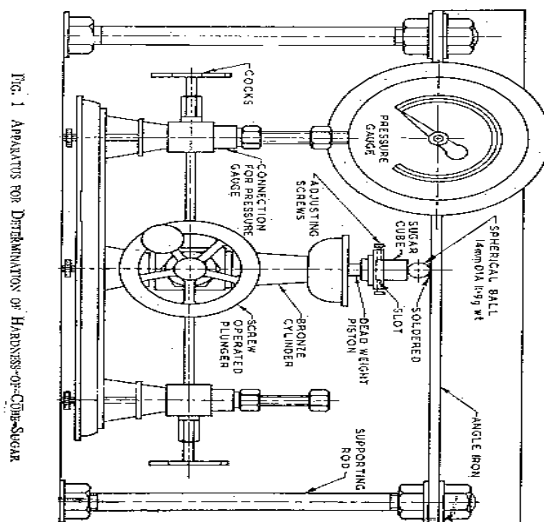


FIG. 1 APPARATUS FOR DETERMINATION OF HARDNESS OF SUGAR

Annex B

(normative)

Test for damage to cubes

B.1 Apparatus

B.1.1 Cylindrical metal drum 35 x 10cm diameter rotated by an electric motor at 40 to 50 rev./min..

B.2 Procedure

B.2.1 Weigh about 100g of sugar cubes accurately and transfer them to the cylindrical metal drum.

B.2.2 rotate the drum by means of an electric motor at the rate of 40 to 50 rev/min.

B.2.3 remove the cubes after 1000 revolutions and weigh.

B.2.4 Report the difference in the weight as the damage.

Annex C

(normative)

Disintegration test

C.1 Apparatus

C.1.1 Flat sieve 15 x 140mm, made of brass wire one millimeter thick with openings of 6.7mm² and 13 openings for every 100mm length, soldered to brass plates at the edges to make it rigid.

C.1.2 Circular brass discs. Ten, each of diameter 2.3 cm, thickness 0.5cm and weight 15.0g.

C.1.3 Glass tubes – Ten, each of internal diameter 2.5 cm and length 16cm.

C.1.4 Glass trough of internal diameter 30cm and height 16cm.

C.1.5 Stopwatch – reading to 0.5 seconds.

C.2 Procedure

C.2.1 Suspend the dry flat sieve by wires from a stand. Place ten sugar cubes on the dry sieve, not touching one another and place one brass disk (C.1.2) on each cube.

C.2.2 Enclose each cube and brass disc by a glass tube. Lower the sieve on the tripod placed in the glass trough containing sufficient water at $20 \pm 1^{\circ}\text{C}$ so that the sieve is 2 cm below the surface of water and 12cm above the bottom of the glass trough.

C.2.3 Note the time with the stopwatch, at which the sixth brass disc sits flat on the sieve.

C.2.4 If the average time of 5 tests is within 60 seconds, the material shall be deemed to have satisfied the test.



Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010. ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.

Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM). It is a founding member of the African Regional Organization for standardization (ARSO).

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